

ROTEL

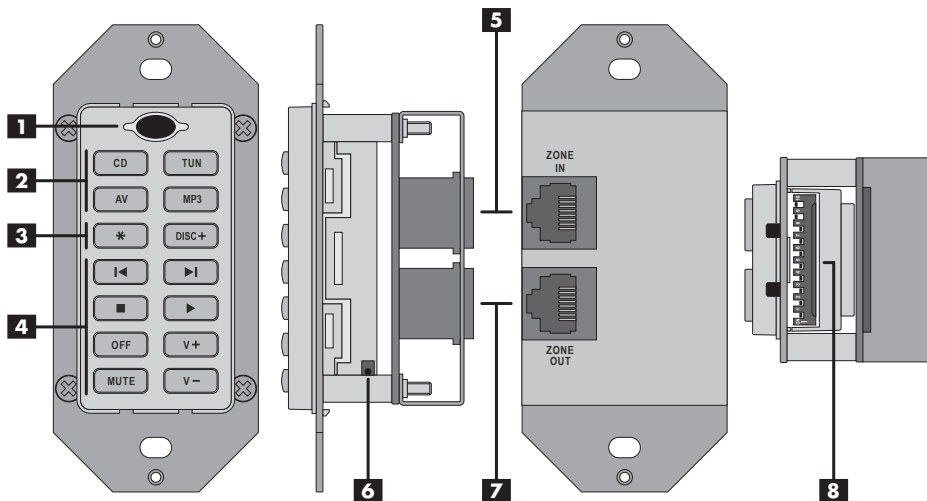


RKP-200
Learning Keypad

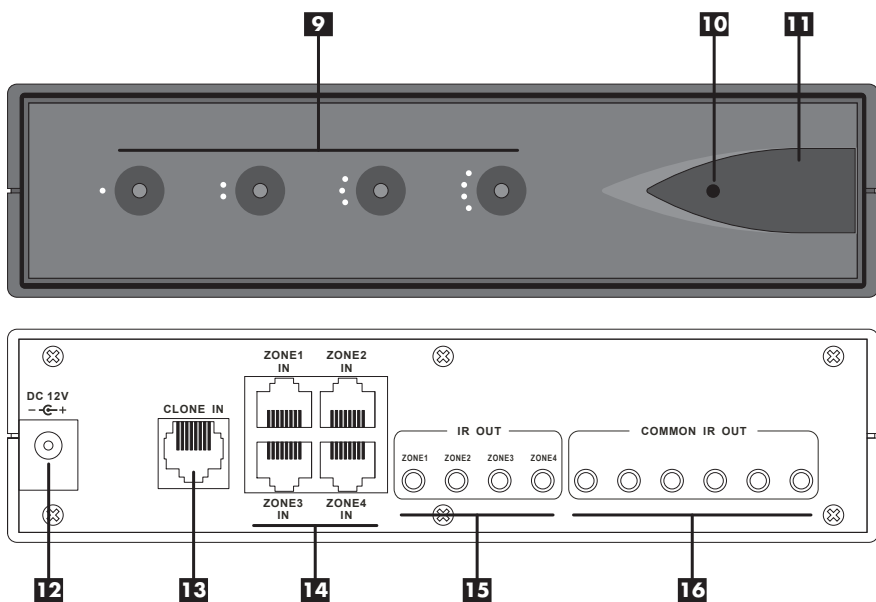


RHB-200
Keypad Connecting Hub

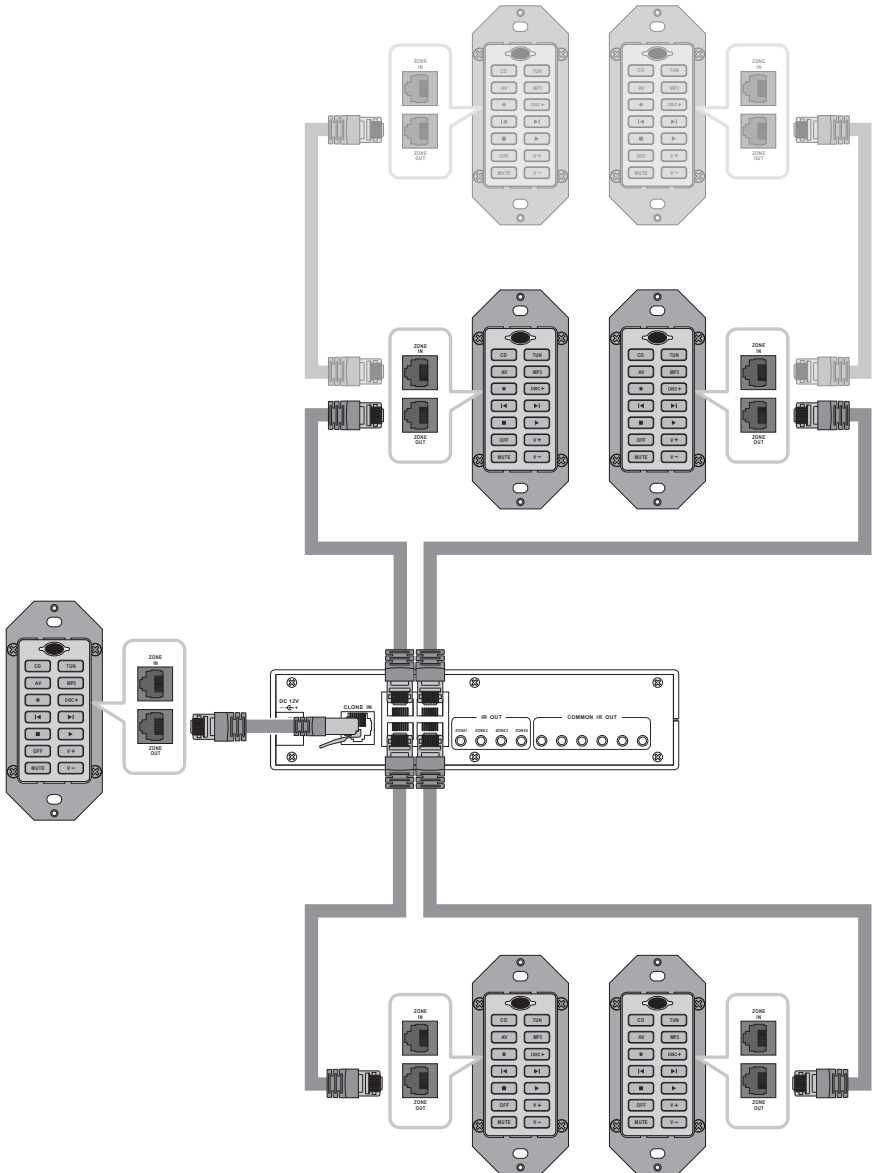
1. RKP-200 Keypad



2. RHB-200 Connecting Hub



5. Clone setup



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Introduction

The RKP-200 Keypad and RHB-200 Connecting Hub provide an integrated system that allows control of Rotel multi-zone systems from wall mounted keypads in remote zones.

Key Features

- Programmed to operate Rotel multi-zone receivers, DVD players, CD players, and AM/FM tuners.
- Learning function to teach the RKP-200 commands from other remotes. Multi-step SMART programming for automatic sequences.
- System allows control from up to four zones.
- Two identically programmed keypads can be installed in each zone.
- Built-in IR sensor allows each keypad to receive commands from a handheld remote.
- Backlighting for use in dark rooms whenever a button is pressed.
- Durable laser-etched buttons with permanent labels. Optional buttons provide alternate labels.
- Cloning feature for easy duplication of the entire command set from one RKP-200 to another.

RKP-200 Overview

The following describes the features and connections on the RKP-200 keypad.

Device Buttons **2**

Four buttons at the top of the keypad are permanently configured as device buttons. Pressing a device button selects the active source input on the multi-zone receiver and changes the function of the command buttons to operate that component.

Command Buttons **4**

Eight buttons at the bottom of the keypad are permanently configured as command buttons. Pressing a command button sends an IR signal to operate the selected component.

Multi-function Buttons **3**

These two buttons are factory programmed as command buttons. However, they can be optionally reconfigured as device buttons should your system have more than four source components.

IR Sensor **1**

An infrared sensor located behind the dark oval lens at the top of the keypad, receives IR commands from a handheld remote control.

Output Connector **7**

A modular RJ-45 jack on the back of the keypad connects the first keypad in a zone to the RHB-200 hub with CAT-5 Ethernet-style cables. Also, used to connect the second keypad in a zone to the first.

Input Connector **5**

A modular RJ-45 jack on the back of the keypad for connecting a second keypad in a zone.

DIP Switches **8**

Ten miniature switches, visible when the keypad is removed from the wall, are used in configuring the keypad.

RESET Button **6**

A small button, visible when the keypad is removed from the wall, cancels all learned commands and restores the factory configuration.

RHB-200 Overview

The following provides a brief description of the features and connections on the RHB-200.

Zone LEDs **9**

Four LEDs on the front panel provide status information during cloning of keypads.

Power LED **10**

LED near right side of front panel illuminates when the RHB-200 is connected to AC power.

Clone Button **11**

Large button at right of front panel. Press to begin cloning during configuration.

+12V DC input 12

The power connector receives +12V signal when AC power supply is plugged into a wall outlet.

Clone Input 13

RJ-45 modular jack accepts CAT-5 cable from keypad during cloning configuration.

Zone Inputs 14

Four RJ-45 modular jacks accept CAT-5 cables from keypads in up to four zones.

Zone IR Outputs 15

Four 3.5mm mini-jacks send IR signals to the zone IR inputs on a Rotel receiver.

Common IR Outputs 16

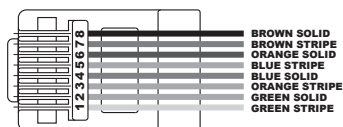
Six 3.5mm mini-jacks send IR signals to source components, either to a direct-wired connection (Rotel components) or to an IR emitter.

Connecting the system

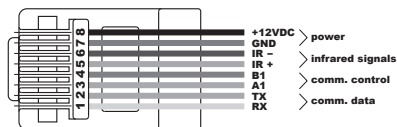
Master keypads in up to four remote zones connect to a centrally-located RHB-200 Connecting Hub using standard Category 5 Ethernet-style cabling and 8-pin RJ-45 modular plugs. A second keypad can be added in each of the four zones, if desired. The second keypad is connected to the master keypad in its zone and provides duplicate functions from a second location.

Cable selection

Run 8-conductor CAT-5 Ethernet cabling from each keypad location to the RHB-200 Connecting Hub. Terminate each end of the cables with standard 8-pin RJ-45 modular plugs. Use a "straight-through" wiring code, with the same color wire connected to the same pin on every plug as shown below. If your cable has different color codes, make sure to wire every modular plug in the same order.



This illustration shows the signals carried by each conductor of the CAT-5 wiring:

**Connecting Master Keypads 7 14**

See Figure 3

The first keypad in each zone is designated as the master keypad. All master keypads connect directly to the RHB-200 Connecting Hub as follows.

1. For Zone 1, connect one end of the cable to the ZONE OUT modular jack on the back of the master keypad.
2. Connect the other end to the ZONE 1 modular jack on the RHB-200 Connecting Hub.
3. Repeat for the master keypads in Zones 2, 3, and 4, using the ZONE 2, ZONE 3, and ZONE 4 modular jacks on the RHB-200.

The master keypads are shown in normal shading on the illustration.

Connecting a Second Keypad 5 7

See Figure 3

An optional second keypad in each zone is designated as a slave keypad. Slave keypads always connect to the master keypad in the zone:

1. Connect one end of a Category 5 Ethernet cable from the ZONE OUT modular jack on the slave keypad.
2. Connect the other end to the ZONE IN jack on the master keypad.
3. Repeat for the master keypads in Zones 2, 3, and 4, using the ZONE 2, ZONE 3, and ZONE 4 modular jacks on the RHB-200.

Optional slave keypads are shown in lighter shading on the illustration.

Mounting the Keypads

Once all of the keypads are connected, programmed, and tested, finish the installation by installing them into electrical boxes.

NOTE: Purchase decorative switchplate covers to match those used in the room for light switches. The RKB-200 is not supplied with decorative switch plate covers because there is no way to know which style or color will match in custom installations.

The exact installation steps may vary depending on the style of switch plate covers you purchase. However, here is a typical installation method using Decora® style covers:

1. Remove the mounting bracket from the back of the decorative cover.
2. Place the mounting bracket over the electrical box.
3. Place the keypad through the mounting bracket and into the electrical box.
4. Place two screws through the mounting tabs on the keypad and through the mounting bracket to secure the keypad. Do not overtighten.
5. Place the decorative cover over the keypad and press in at the top and bottom until secure. There is a small slot in one edge of the decorative cover. Orient the cover so this slot is facing down.

NOTE: Do not mount the keypads until all programming steps are complete and the system has been tested. Access to DIP switches at the back of the keypads is necessary during programming.

Connecting the RHB-200 to a Rotel Receiver

See Figure 4

The RHB-200 connecting hub sends command codes to a Rotel multi-zone receiver using infrared commands. The connections are made using two-conductor cables with 3.5mm mono mini plugs on both ends. One cable is needed for each zone with a keypad, up to a max of four. A Rotel RX-1052 multi-zone receiver is shown in the example:

1. Plug one end of the first cable into the ZONE 1 IR OUT connector on back of the RHB-200.

2. Plug the other end of the cable into the zone 1 IR input on the receiver, labeled EXT REM IR IN on the Rotel RX-1052.
3. Repeat for any additional zones, matching the ZONE 2 IR OUT on the RHB-200 to the ZONE 2 IR IN on the receiver, etc.

Connecting the RHB-200 to Source Components

See Figure 4

The RHB-200 connecting hub sends command codes to source components (such as CD players) using infrared commands. With most Rotel source components, connections are made using two-conductor cables with 3.5mm mono mini plugs on both ends. One cable is needed for each source component.

1. Plug one end of the cable for the first Rotel source component into any of the COMMON IR OUT connectors on back of the RHB-200.
2. Plug the other end of the cable into the EXT REM IN IR input on first source component.
3. Repeat for any source components, using any available COMMON IR OUT connectors on the RHB-200.

NOTE: If your source component does not have an input for a hard-wired IR cable, you can use an industry standard IR emitter placed in front of the source component's infrared remote sensor. Connect the other end of cable to a COMMON IR OUT connector on the RHB-200. This type of source component is shown at the bottom of Figure 4.

AC Power connection

Once all of the keypad and IR connections are complete, supply power to the RHB-200.

1. Plug the connector from the supplied AC adaptor into the +12V input on the back of the RHB-200.
2. Plug the AC adaptor into an AC power wall outlet.

Operating the Keypads

The keypads are preprogrammed to operate the Rotel RX-1052 multi-zone receiver and the following source components:

Rotel CD Players:

RCD-1072 & RCC-1055

Rotel Tuner:

RX-1052 built-in tuner

Rotel DVD Player:

RDV-1092/RDV-1060

MP3 Players:

Navigod and the most popular brands of portable players

Although the keypads can be customized with learned commands, there is no need to do so when used with components listed above.

Selecting a component 2 3

Press one of the four standard device buttons (CD, TUN, AV, MP3) to select that source component as the input for the zone. Once you have selected the component, use the 10 command buttons to operate the component you have selected as described below.

NOTE: If you choose to customize the keypads, two more buttons (* and DISC+) can be used as additional device buttons.

Operating a CD Player 2 3 4

Press the CD button to select the CD player. A SMART sequence automatically starts disc playback. The following commands are available:

CD	Select CD input and begin play
*	Random Play
DISC+	Select Disc (changers only)
◀	Track Backward
▶	Track Forward
■	Stop
▶	Play
OFF	Turn off zone and backlighting
MUTE	Mute sound
V+	Increase volume
V-	Reduce volume

Operating a Tuner 2 3 4

Press the TUN button to select the AM/FM tuner. The following commands are available:

TUN	Select tuner input
*	Tuner Preset #1
DISC+	Tune Up
▶	Tune Down
◀	Preset Up
▶	Preset Down
■	Preset Scan
OFF	Turn off zone and backlighting
MUTE	Mute sound
V+	Increase volume
V-	Reduce Volume

Operating a DVD Player 2 3 4

Press the AV button to select the DVD input. The following commands are available:

AV	Select VIDEO 1 input
*	No command
DISC+	No command
▶	Play
◀	Track backward
▶	Track forward
■	Stop
OFF	Turn off zone and backlighting
MUTE	Mute sound
V+	Increase volume
V-	Reduce volume

Operating an MP3 Player 2 3 4

Press the MP3 button to select the MP3 input. The following commands are available:

MP3	Select VIDEO 2 input
*	Shuffle play
DISC+	Next playlist
▶	Play/Pause
◀	Previous song
▶	Next song
■	Play/Pause
OFF	Turn off zone and backlighting
MUTE	Mute sound
V+	Increase volume
V-	Reduce volume

Backlighting 2 3 4

As delivered from the factory, the keypads have automatic backlighting for the device buttons and the MUTE button.

When a device button is pressed, the backlighting for that button remains lit to indicate the currently selected device.

The backlighting for the MUTE button remains on when the sound is muted. The backlighting turns off when the MUTE button is pressed again or when muting is cancelled by pressing the V+ or V- buttons.

All backlighting is turned off when the OFF button is pressed and remains off until a device button is pressed.

NOTE: *The backlighting feature can be permanently disabled during configuration of the keypads.*

IR Sensor 1

An infrared sensor is located behind the dark oval lens at the top of the keypad. This sensor receives IR commands from a handheld remote control aimed at the keypad.

IR commands received by the IR sensor do not change the backlighting on the keypad. For example, a MUTE command received from a handheld remote will not light the MUTE button on the keypad.

MUTE: *The IR sensor can be disabled during configuration of the keypads. Generally, the sensor of a second keypad in a zone should be disabled if there is a chance of IR signals reaching both keypads simultaneously.*

Configuring the keypads

With the default factory configuration, the keypads are ready to use in a system with Rotel components as described in the *Operating the Keypads* section of the manual. However, the keypads can be customized in several ways during setup. Options include:

- Learning commands from handheld remote controls in place of the existing commands.
- Combining the commands in a SMART sequence that is sent whenever a device is selected.
- Using two additional buttons as device keys, for a total of six available source components.
- Disabling the infrared sensor on the front of the keypad.
- Disabling the backlighting.
- Resetting the keypad to its default factory configuration.
- Replacing the standard button labels with optional labels.

This section of the manual provides instructions for each of these configuration steps.

NOTE: *An additional customizing feature is Cloning, which allows quick transfer of learned commands and SMART sequences to additional keypads. Cloning is covered in a later section of the manual.*

Using the DIP switches 3

All of the configuration options require the use of small DIP switches located on the bottom of the keypad. These switches are only accessible before the keypad is mounted in an electrical box. Therefore, customizing should be completed before mounting the keypads.

The location of the DIP switches can be seen in Figure 1 at the front of this manual. Here are the default settings for all ten switches:



Details of the switch settings are provided with the instructions for each configuration option, but here is a summary:

- SW1:** Used for invisible layer command programming for the CD device.
- SW2:** Used for invisible layer command programming for the TUN device.
- SW3:** Used for invisible layer command programming for the AV device.
- SW4:** Used for invisible layer command programming for the MP3 device.
- SW5:** In the ON position, enables the * button as an additional device key.
- SW6:** In the ON position, enables the DISC+ button as an additional device key.
- SW7:** Enables the learning mode in the ON position.
- SW8:** Enables the SMART programming mode in the ON position.
- SW9:** Enables (ON) or disables (OFF) the IR sensor on the front of the keypad.
- SW10:** Enables (ON) or disables (OFF) the backlighting feature.

Disabling Backlighting 8

The RKP-200 backlighting feature illuminates a device button as a reminder of the selected device as well as the MUTE button when the sound is muted.

SW10 configures the backlighting mode:

To enable the backlighting, put SW10 in the ON position.



To disable the backlighting, put SW10 in the OFF position.



NOTE: Flashing button illumination provides confirmation and error indications during the Learning and SMART sequence programming. The backlighting should be enabled during configuration.

Disabling IR Sensor 8

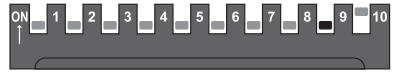
An IR sensor on the front of the keypad allows operation of the system from a handheld remote control aimed at the keypad. This sensor can be disabled. Generally, the sensor only needs to be disabled when two keypads are installed in the same room. In this case, disable the sensor on the second keypad to prevent sending IR commands to both keypads. For the same reason, you might disable the sensor of a keypad installed near the components being controlled.

SW9 configures the sensor mode:

To enable the IR sensor, put SW9 in the ON position.



To disable the IR sensor, put SW9 in the OFF position.



NOTE: Learning commands is done by aiming a handheld remote at the keypad sensor. The sensor must be enabled during Learning configuration.

Optional Device Buttons 3 8

The keypad has four permanent device buttons: CD, TUN, AV, MP3. These device buttons select a source component for listening and operation. Pressing a device button makes the normal commands on the other ten buttons available. Device buttons cannot store normal learned commands; however, they can store a SMART sequence of normal commands that is sent when the device button is pressed.

The RKP-200 provides the option of designating the * and/or the DISC+ buttons as additional device buttons. SW5 configures the * button. SW6 configures the DISC+ button.

To make * the only additional device button, put SW5 in the ON position:



To make DISC+ the only additional device button, put SW6 in the ON position:



To make both * and DISC+ additional device buttons, put both SW5 and SW6 in the ON position:



For no additional device buttons, put both SW5 and SW6 in the OFF position:



Learning commands 1 2 3 4 8

The RKP-200 keypad is programmed at the factory with basic commands for Rotel and other components as described in the Operating the Keypads section of the manual. These commands can be replaced when using non-Rotel components or for access to different features.

New commands are learned by the keypad by using a learning procedure during initial configuration of the keypad involving aiming the handheld remote for the component at the IR sensor on the keypad.

The four device buttons (CD, TUN, AV, MP3) cannot be used to learn commands. In addition, you should not learn new commands replacing the OFF, MUTE, V-, and V+ commands. Therefore, there are six buttons available for learning. These buttons can store commands for each of the devices, ten commands for the CD device, ten for the TUN device, etc. Overwriting commands for a device will not change the existing commands for any of the other devices.

If you have designated * and/or DISC+ as device buttons (SW5 and/or SW6 in the ON position), these buttons cannot be used to learn commands. However, they can be used as device buttons with commands learned on other buttons, just like the four standard device buttons (CD, TUN, AV, MP3).

In addition to learning commands on standard buttons, each of the four main device buttons (CD, TUN, AV, MP3) can store 14 invisible layer commands. These commands cannot be used during normal system operation from the keypad; however, they can be used as part of Smart Macro sequences. The procedure for learning these invisible layer commands is described in the next section.

In this example of learning standard commands, we will change the command for the DISC+ button for the CD device to a PAUSE command instead of the original NEXT DISC command. To learn the new command:

1. The MUTE button lighting flashes to confirm successful or failed learning. So, the backlighting feature must be active before starting the learning procedure (SW10 in the ON position). Also, the IR sensor must be enabled (SW9 in the ON position). Confirm the position of SW9 and SW10:



2. Press the device key containing the commands (the CD button in this example).
3. Put the keypad into Learning mode by moving SW7 to the ON position:



4. Within 30 seconds, press the keypad command button that you wish to learn (in this example, the DISC+ button). The backlighting on the MUTE button turns on and the keypad is ready to receive the IR code. It will flash six times if an improper button is pressed (for example, a device button that cannot be learned).

- Aim the handheld remote at the oval sensor on the front of the keypad from a distance of approximately 1 inch (25 mm). Press and hold the button on the handheld remote with the command to be learned (the PAUSE button, in this example).
- If the command is successfully learned, the MUTE button will flash twice. Six flashes indicate that the learning failed. If the learning failed, repeat from Step 4.
- To learn additional commands, repeat from Step 4, pressing the next keypad button to be learned.
- Exit Learning mode by setting SW7 to the OFF position:



Learning invisible layer commands

1 2 3 4 8

Each of the four devices (CD, TUN, AV, MP3) on the RKP-200 keypad can store 14 invisible layer commands. These commands cannot be accessed during normal operation of the keypads; however, they can be used as part of Smart Macro sequences.

The procedure for learning an invisible layer command is similar to learning a standard command, except that four switches SW1 – SW4 are used to select the invisible layer, one switch corresponding to each device. Once the invisible layer is selected, any of the 14 buttons can be used to store an invisible layer command without overwriting the standard commands stored for each button. With an invisible layer for each of the four devices, a total of 56 invisible layers commands can be stored, 14 for each device

To learn an invisible layer command:

- The MUTE button lighting flashes to confirm successful or failed learning. So, the backlighting feature must be active before starting the learning procedure (SW10 in the ON position). Also, the IR sensor must be enabled (SW9 in the ON position). Confirm the position of SW9 and SW10:



- Select the device where you want to store the invisible layer command by placing one (and only one) of switches SW1 – SW4 in the ON position, as follows.

To learn invisible layer commands **for the CD device**, place SW1 in the ON position:



To learn invisible layer commands **for the TUN device**, place SW2 in the ON position:



To learn invisible layer commands **for the AV device**, place SW3 in the ON position:



To learn invisible layer commands **for the MP3 device**, place SW4 in the ON position:



To learn standard commands, exit the invisible layer mode by putting SW1 – SW4 all in the OFF positions. :



- Put the keypad into Learning mode by moving SW7 to the ON position. In this example, we are learning invisible layer commands for the CD device:



4. Within 30 seconds, press the keypad command button that you wish to learn (in this example, the **DISC+** button). The backlighting on the **MUTE** button turns on and the keypad is ready to receive the IR code. It will flash six times if an improper button is pressed (for example, a device button that cannot be learned).
5. Aim the handheld remote at the oval sensor on the front of the keypad from a distance of approximately 1 inch (25 mm). Press and hold the button on the handheld remote with the command to be learned (the **PAUSE** button, in this example).
6. If the command is successfully learned, the **MUTE** button will flash twice. Six flashes indicate that the learning failed. If the learning failed, repeat from Step 4.
7. To learn additional commands, repeat from Step 4, pressing the next keypad button to be learned.
8. Exit Learning mode by setting SW7 to the OFF position. Then, exit invisible layer mode by returning SW1 – SW4 to the off positions.



Programming a SMART Sequence

2 3 4 8

The four standard device buttons (**CD**, **TUN**, **AV**, **MP3**) and the two optional device buttons (***** and/or **DISC+**) can store a sequence of commands to be sent when the device button is pressed. For example, the **CD** device button is programmed to switch the Rotel receiver to the **CD** input and begin disc play.

You can store a new **SMART** sequence for any device button using the following procedure. In this example, we will program the **AV** device button to select the **DVD** input, pause for 2 seconds, and begin disc play.

1. The **MUTE** button lighting flashes to confirm successful **SMART** programming. The backlighting feature must be active before starting (SW10 in the **ON** position).



2. Put the keypad into **SMART** programming mode by moving SW8 to the **ON** position. Make sure that SW7 is **OFF**.



3. Within 30 seconds, press the keypad device button where you wish to store the **SMART** sequence (in this example, the **AV** button). The backlighting on the **MUTE** button flashes twice.
4. Press the first step of the **SMART** sequence. In this example, press the **AV** button, since the first step is to select the **DVD** input.
5. Press the next step in the **SMART** sequence. In this case, add a two second delay by pressing the **V+** button twice. This is a special command; each press adds a one second delay.
6. Press the next command in the sequence. In this case, the **▶** button, since the final step in the sequence is to start **DVD** disc playback. Up to 20 steps can be saved in a sequence. Each one second delay counts as one step.
7. Exit **SMART** mode by setting SW8 to the **OFF** position:



Programming a SMART Sequence with Invisible Layer Commands **2 3 4 8**

To include invisible layer commands in a SMART sequence, substitute the following steps for Step 4 in the preceding instructions:

- Put SW1, SW2, SW3, or SW4 in the ON position to select the invisible layer where the desired command is stored:



- Press the invisible layer command button.
- Return the SW1 – SW4 switch to the OFF position to exit invisible layer mode.



Cloning **9 11**

Once you have completed the learning and SMART sequence programming for one keypad, it is easy to transfer that programming to all of the keypads connected to the RHB-200 with a procedure called cloning.

To clone a keypad:

- With the RHB-200 disconnected from the AC wall power, connect the ZONE OUT connector of the programmed keypad to the CLONE IN modular jack on the back of the RHB-200 using a CAT 5 cable.
- Make sure that all keypads to be programmed are connected properly as shown in Figure 5. You can program two keypads in a single zone as shown by light shaded keypads in the illustration.

NOTE: Keypads in the remote zones must not be in Learning or SMART configuration mode.

- Power on the RHB-200 by connecting it to the AC power source. The four Zone LEDs on the front of the RHB-200 flash green once. The MUTE LED on the keypad being cloned flashes once.
- Press the large CLONE button on the front panel of the RHB-200. The cloning process begins in sequence, starting with the first key-

pad in ZONE 1. While this keypad is receiving cloned data, the ZONE 1 LED on the front of the RHB-200 flashes red. When the cloning of the first keypad is complete, the LED glows solid red. The cloning process then continues to the second keypad in ZONE 1 (if it exists). The LED flashes green during the cloning and glows solid green when the cloning is complete.

- Step 5 is then repeated automatically for Zone 2, Zone 3, and Zone 4 as necessary. The entire cloning process can take up to 10 minutes.
- If an error occurs, all four LEDs on the RHB-200 flash green six times and the DEVICE buttons on the zone keypads flash on for one second.

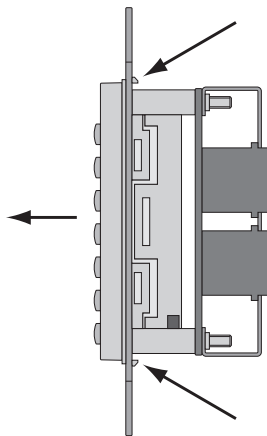
Resetting keypads **6**

Should you want to reset a keypad to its original factory programming, use a small pointed object to press the reset button on the side of the keypad. This erases all learned commands and SMART sequences.

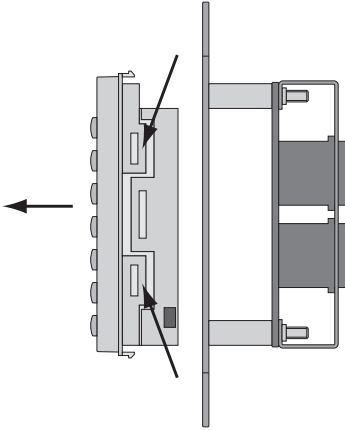
Changing buttons

A selection of replacement buttons is available from Rotel to customize keypads. To replace buttons:

- Press the two tabs at the top and bottom of the keypad and pull the keypad module from the mounting bracket:



- Using a small flat blade screwdriver, release the four tabs on the sides of the module, releasing the keypad cover.



- Once the keypad cover has been removed, pull a button off and replace it with one of the optional buttons.

